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UNITED STATES DEPARTMENT OF AGRICULTURE
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AN ANNOTATED LIST OF THE FAUNA
ASSOCIATED WITH THE MOUNTAIN PINE BEETLE
IN WESTERN WHITE PINE AND LODGEPOLE PINE

By
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Respectfully submitted

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Insects like plutocrats are generally surrounded by considerable numbers of their kind, some of which prey on them and others that are indirectly attracted by the conditions set up. In the case of the mountain pine beetle (Dendroctonus monticolae Hopk.) a great many insects are found in association with them as parasites, predators, facultative predators, coprophages, saprophages, mycetophages, xylophages, and inquilines.

The following list is a record of the insects that have been found associated in any way with the brood of the mountain pine beetle during the period that the tree was infested by them. No beetles are listed that were found in the trees after the brood of the beetle had emerged with two exceptions which are given because of unusual interest. The period that the beetles or their brood are in the tree is approximately one year. They attack the healthy trees chiefly during July and August; the eggs hatch after an incubation period of ten days to two weeks, and the larvae feed until cold weather sets in and continue to feed the following spring. Pupation occurs during the latter part of June and the forepart of July, and the adults after transformation remain under the bark for varying periods, but the majority have emerged by the middle of August.

The mountain pine beetle is of unusual interest as it has been causing terrific losses to the stands of lodgepole pine, western yellow pine, and western white pine in Washington, Idaho, and Montana for the past twenty years. In Montana during the single season of 1930 over 3,500,000 trees were killed on the Beaverhead National Forest alone.

A study to determine what parasites and predators of the beetle are of economic importance and to develop some method or methods by which artificial control can be done in such a way that these beneficial insects would not be destroyed was carried out by the writer during August and September of 1928 and all of 1929 on the Beaverhead National Forest, near Sula, Montana, and during the season of 1930 on the Kaniksu National Forest, near Metaline falls, Washington.

Further investigation is needed, however, to show why outbreaks of this beetle are not controlled sooner by its natural enemies after a reasonable period of time. Since the mountain pine beetle is a native to this region, it would seem possible that if the environmental conditions which affect the beetles or their parasites had not been disturbed, the parasites would be able to keep the broods of the beetle reduced to a point where their damage would be slight. As the beetle has been increasing for many years, it would seem that some factor has disturbed the ratio of beneficial insects to the brood of the beetle. But what this factor is has not been determined.

The notes comprising the following list were made with but three or four exceptions, which are noted under the insect concerned, for lodgepole pine at Sula, Montana, during August and September in 1928 and May to September in 1929; and for western white pine at Metaline Falls, Washington in 1930; consequently, any mention of these trees gives the year and the region so that these are not given unless necessary for clearness.

The name of the specialist who determined the specimens is given in double parentheses after each name. The list below shows the abbreviations used. Where no specialist is given, the determinations were made by the writer by comparison with previously determined specimens in the station

3.

collection, except the Siricidae, which were determined by key alone, and the ants, which were compared by Mr. H. J. Rust with material collected by him in the same locality and determined for him by Mr. W. V. Mann.

J. N. Aldrich	A.	H. E. Ewing	E.
H. S. Barber	Ba.	W. S. Fisher	F.
M. E. Blackman	Bl.	A. B. Gahan	Ga.
A. C. Boving	Bo.	C. T. Greene	Gr.
L. L. Buchanan	Bu.	Carl Heinrich	He.
H. E. Burke	Bur.	A. D. Hopkins	Ho.
August Busck	Bus.	E. G. Lindsley	L.
A. N. Caudell	Cd.	William Middleton	M.
E. A. Chapin	Ch.	O. Steiner	S.
		E. C. Van Dyke	VD.

Where the names of two specialists appear after the same insect two different forms such as the larva and adult, or dimorphic adults were determined. Acknowledgment is made to all of these men.

The list is not complete, owing to many as yet undetermined species, but as the writer is discontinuing this study and no further work is to be done on this problem for some time, it is felt that such a list may be of value to workers in other regions.

Nemus

Diplogaster idahoensis Steiner ((S.)).

Panthaphelenchus conurus Steiner ((S.)).

" acroposition Steiner ((S.)). These three new species were collected in western white pine under the bark of trees that had been killed the previous season or/and in trees that had been attacked not more than two weeks. It is possible that only one of the species was secured from trees recently attacked, as negligantly all the nemus collected were placed in one vial.

ORDER ANAMORPHA

Centipedes were collected in May under the bark of western white pine. In captivity, they will feed on the larvae of D. monticolae and the larvae of Coeloides sp. within their cocoons.

ORDER PSEUDOSCORPIONIDA

Chelifer sp. ((E.)). Found occasionally in lodgepole and western white pine trees that were dead less than a year, but much more common in trees that had been dead for several years.

ORDER ARANEA

Several undetermined species of spiders have been observed on the bark of infested trees of both species. One was observed to capture an adult Coeloides sp. and another an adult Medeterus aldrichi Wh.

ORDER NEUROPTERA

Family Chrysopidae

Chrysopa sp. ((Cd.)). Predacious, but it is doubtful whether they prey on the larvae of the mountain pine beetle. One larva which was collected July 29, 1929, pupated between August 2 and 3; emerged as adult between August 20 and 21. Found only in lodgepole pine.

Family Raphidiidae

Raphidia sp. These were found occasionally in lodgepole pine, but none in western white pine.

ORDER HEMIPTERA

Family Anthocoridae

Several species, the determinations for which have not yet been received, but which probably belong to this family, were collected on lodgepole pine most of the summer and on western white pine during May. They will feed on the larvae of the mountain pine beetle if the opportunity arises.

ORDER COLEOPTERA

Family Carabidae

Tachyta angulata Csy. ((Du.)). Habits not known. One adult was collected under the bark of a lodgepole pine June 25, 1929.

Family Silphidae

Leiodess globosa Lec. ((F.)). Probably saprophagous. One adult was collected July 19, 1928 in a lodgepole pine infested the previous year. None was found in western white pine.

Leiodes sp. ((F.)). Adults were collected during April and May in western white pine. None was found in lodgepole pine.

Family Corylophidae

Sacium lugubre Lec. ((F.)). Probably saprophagous. One adult was collected in May and one in June on lodgepole pine.

Family Staphylinidae

Tachyporus sp. ((Bo.)).

Gyrophaena sp. ((Bo.)).

Phloeonomus pusillus Grav. ((Ch.)).

Placusa sp.

Leptusa sp. Little was learned about the habits of any of these species. They were very abundant at times under the bark of infested trees, both in lodgepole pine and western white pine.

Hudobius. Predacious. Two undetermined species were secured; one occurred only in lodgepole pine and the other only in western white pine.

Quedius longipennis Mann. ((Ch.)). Predacious. This species was found only in lodgepole pine in May and in August.

Quedius sp. Predacious. An undetermined species which occurred only in western white pine, and was collected during May and June.

Family Histeridae

Isolomalus mancus Cay. ((Ba.)). Both the larva and adult are predacious. In western white pine this was a rather common species. Adults and larvae were found early in the field season. A larva collected July 7, 1930, pupated between July 25 and 29 and the adult emerged between August 8 and 9. What appears to be the same species is less common in lodgepole pine but rather common in Montana in yellow pine infested with the mountain pine beetle.

Platysoma punctigerum Lec. Predacious. In yellow pine this was a very common species, in lodgepole pine less common, and in western white pine only one specimen was secured.

Plegaderus sp. Probably predacious. A rather common species in western white pine but in lodgepole pine only one specimen was secured.

Family Cantharidae

Cantheris sp. ((Ba.)). Doubtfully predacious. It was found in lodgepole pine in the larval stages. Rare.

Family Melyridae

Melachius sp. ((Ba.)). ((Ba.)). Doubtfully predacious. It occurred during July in lodgepole pine. It was rather uncommon.

Listrus sp. ((Ba.)). Doubtfully predacious. In lodgepole pine it was found during June and July in the adult stage.

Family Cleridae

Eucleonus lecontei (volc.). Predacious. This is not a very common species either in lodgepole pine or western white pine.

Eucleonus sphagus (Fabr.). Predacious. Adults were more common in western white pine than lodgepole pine, but it appeared to be of little economic value.

Thanasimus dubius Fab. Predaceous. This is the most common of the three species in lodgepole pine and western white pine, but apparently it is not sufficiently abundant to be of economic value.

Family Othniidae

Othnius sp. One adult was reared from a larva collected July 19, 1929 in a tree infested the previous year.

Family Pythidae

Pytho planus Herbst. ((VD.)). Occasionally predaceous. It is fairly common in lodgepole pine and western white pine. The adults were most numerous in May and June. In Washington 41 eggs were laid by one female between June 29 and July 1, 1930. The larvae were found practically all season.

Pytho sp. This species was found only in western white pine during May. Nothing is known of its habits, but they are probably the same as those of P. planus Herbst.

Family Elateridae

Elater brevis Van Dyke ((VD.)). One was collected on lodgepole pine in May.

Limonius seeger Lec. ((VD.)). Collections were made from lodgepole pine in June.

Ludius propola (Lec.) ((VD.)). A few were observed on lodgepole pine in May and in June.

L. aereipennis (Kby.). ((VD.)). One was collected ovipositing in a lodgepole pine tree in June.

L. triundulatus (Rand) ((VD.)). A fairly common species on lodgepole pine in June and July.

Family Buprestidae

Dicerca tenebrosa Kirby ((Bur.)). A fairly common species during June and July on lodgepole pine.

Buprestis maculiventris Say var. rusticum (Kirby). Adults were found on lodgepole pine in late July and August.

Buprestis alternans (Lec.). Adults were found ovipositing on lodgepole pine late in July and August.

Melanophila intrusa Horn ((Bur.)). One adult was collected on lodgepole pine late in August.

Chrysobothris breviloba Fall ((Bur.)). Adults were observed on lodgepole pine in June, July, and August.

Family Ototomidae

Tenochtila virescens (Fab.) var. chlorodes (Vann.). The adults and larvae are predacious but of no economic importance. Rather uncommon in lodgepole pine but more common on western yellow pine. The adults were found in the fall and the larvae were found in the spring. In western white pine larvae were found in early September and the following spring.

Family Nitidulidae

Glischrochilus vittatus (Say) ((VD.)). Facultative predator. The adults were common in lodgepole pine all season except the first month after the new attack of the mountain pine beetle. The eggs were laid the middle of June. The larvae were common during June and July; pupae were secured during August. No individuals of the species or genus were found in western white pine.

Epuraea linearis Maki. ((VD.)). Doubtfully predacious. The adults have been observed feeding on the larvae of D. monticolae but it is probable that they began feeding after the larvae had died. They are common in lodgepole pine from one month to at least two years after the attack of the

barkbeetle. What appears to be a different phase or species is commonly found in western white pine. An adult was observed in the laboratory to attack a pupa of D. monticolae but it was unable to pierce the pupal cuticle.

Family Rhizophagidae

Rhizophagus procerus Cey. ((VD.)). Probably a facultative predator. It was common in lodgepole and western white pine the entire season. The adults and larvae have been observed feeding on the eggs and larvae of D. monticolae and other subcortical insect larvae.

Family Monotomidae

Hespeobaenus abbreviatus Mots. ((VD.)). One adult was collected in September under the bark of a western white pine, Coeur d'Alene, Idaho in 1929.

Family Curculionidae

Laemophloeus angustulus Lec. ((VD.)). This species is probably predacious on smaller insect larvae. It was found practically all season in lodgepole pine but it was less common in western white pine.

Cucujus clavipes Fabr. var. puniceus Mann. Predacious. It was rarely found in lodgepole pine, but it was rather common in infested western yellow pine in the same region. In western white pine they were fairly common in May.

Family Colydiidae

Aulonium longum Lec. Probably facultative predator. It was rarely found in lodgepole pine, but it was abundant in western yellow pine in the spring in the same region. In western white pine, only one was observed in May.

Lasconotus pertenuis Gey. ((VD.)). It is probably predacious, but not on the larvae of the mountain pine beetle. Adults were found in lodgepole pine from May to September. They were very rare in western white pine, and were only observed during the latter part of July in a newly attacked tree.

Lasconotus simplex Lec. var. ((F.)). The habits are probably similar to pertenuis, though it was only found in lodgepole pine.

Lasconotus complex Lec. ((VD.)). Occasionally predacious. This species was the most common representative of this genus. It was more common in lodgepole pine, where it occurred all season, than in western white pine. In the former tree species, the eggs were laid about the middle of June. The incubation period is at least 5 days. The pupae were found the latter part of July and early August.

Lasconotus subcostulatus Kraus. ((VD.)). Males were found in June in the tops of western white pine but in the galleries of Orthotomicus caelatus.

Family Lathridiidae

Corticaria serrata (Payk.) ((VD.)). Probably a scavenger. One adult was found the middle of July in lodgepole pine.

Family Tenebrionidae

Hypophloeus parallelus Melsh. ((F.)). Facultative predator. The adults were found in lodgepole pine and western white pine. It was fairly common all season. In lodgepole pine one egg was secured in June; in western white pine several eggs were laid in May. The incubation period for one egg was 10 days.

Hypophloeus slaher Lec. ((F.)). Probably a facultative predator.

The adult occurred both in lodgepole pine and western white pine from April to July, but they were less common than H. parallelus.

Bius eatriatus Lec. ((VD.)). Habits not known. Adults were found in lodgepole pine in April, May, June, and early July.

Family Melandryidae

Xylita levigata Hellw. ((VD.)). Not predacious. The adults were fairly common on lodgepole pine from late May into August. The larvae were not observed.

Scotochroa basalis Lec. ((VD.)). Adults were found with the preceding species in lodgepole pine but were less common. The larvae were not observed.

Rashia sp. ((Ch.)). An adult was collected on the bark of a lodgepole pine July 1, 1929.

Family Anobiidae

Ernobius sp. ((J.)). One adult was collected June 10, 1929 ovipositing on lodgepole pine. Ten eggs were laid between July 1 and 10; they hatched between July 25 and 27.

Family Bostrichidae

Adults and larvae of an undetermined species were collected in September in lodgepole pine.

Family Cerambycidae

Spondylis upiformis Ann. The adults were common on lodgepole in June. They do not appear to be common in western white pine.

Aesalus atrum Fesch. The adults were most common in July on lodgepole pine.

Nothorkina aspera Lec. ((F.)). A few adults were found on lodgepole pine and western white pine in August.

Stenocoris lineatum (Oliv.). On lodgepole pine they were found in late May and early June. In white pine a female was observed ovipositing May 27, 1929. The eggs hatched between June 5 and June 8.

Leptacmaeops alticola Cay. ((F.)). An adult was reared during the season of 1929 from a lodgepole pine tree caged within 4 weeks after the 1925 attack.

Anthophilax mirificus Bland ((VD.)). ((F.)). Males were found on lodgepole pine in June, and one female was observed ovipositing in a tree June 22, 1929; others were found on July 1, 1929. One male was found on white pine in May. Adults were collected also from yellow pine at Sula, Montana and alpine fir at Metaline Falls, Washington.

Anoplerda aspera (Lec.) ((F.)). Adults were found on lodgepole pine trees in July.

Xyletretchus undulatus (Say) ((VD.)). The adults were observed in August on lodgepole pine; in white pine one was found ovipositing on a tree attacked less than a week.

Monochamus oregonensis Lec. The adults were found late in July and August on lodgepole pine (and in western white pine in August. Doubtful record).

Monochamus obtusus Cay. Adults were found on bark of western white pine in October, 1929 (Rust).

Acanthocinus obliquus Lec. This species occurred on lodgepole pine in July. Adults were found in July and August on western white pine. The larvae were very common in April, May, and June. At times they may be a valuable enemy of the brood of the beetle. Pupation generally occurs towards the end of July, either under bark or in the wood about an inch. The stadium of six pupae ranged from 12 to 15 days.

Pogonocherus sp. ((F.)). An adult was collected in May on a lodgepole pine.

Pogonocherus propinquus Bland ((L.)). An adult was reared by August from a lodgepole pine that was caged in early May, 1929.

Tetropium velutinum Lec. An adult was collected August 5, 1930 on a western white pine tree.

Family Curculionidae

Cossonus piniphilus Boh. ((F.)). Adults were collected in July in western white pine attacked the previous year. Coeur d'Alene, Idaho (Bust).

Family Scolytidae

Cryturgus borealis Sw. ((Bl.)). The adults were collected under the bark of western white pine during the spring and fall.

Polygraphus rufipennis (Kby.). The adults were collected underneath bark of western white pine during September.

Dendroctonus murrayanae Hopk. The adults were collected in the base of a lodgepole pine in late July and August.

Dendroctonus valens Lec.. The adults were collected in the base of lodgepole pine in late July and August.

Hylurgops rugipennis (Mann.) ((Ho.)). The adults and larvae were collected in western white pine during June and July, Coeur d'Alene, Idaho, (Evenden).

Hylurgops subcostatus (Mann.) ((Ho.)). The adults were collected in western white pine during June and July, Coeur d'Alene, Idaho, (Evenden, 1920).

Trypodendron rufulans (Kby.) ((Bl.)). The adults were collected from lodgepole pine in June, (Bust).

Trypodendron bivittatum (Kroy.) ((Ho.)). The adults were collected in June and July in western white pine, Coeur d'Alene, Idaho. (Evenden, 1920).

Pityophthorus burkei Blackm. ((Bl.)). The adults and larvae were collected in lodgepole pine during June and July.

Pityogenes fossifrons Lec. The adults and larvae were common under the bark of western white pine in June and July.

Pityogenes knechteli Sw. The adults were collected in association with P. fossifrons Lec.

Ips radiatae Hopk. The adults and eggs were collected in July in lodgepole pine attacked the previous August.

Ips vancouveri Sw. ((Bl.)). The adults were common in western white pine during August and September and the preceding spring.

Ips latidens (Lec.). The adults were collected in June and July in lodgepole pine. (and from western white pine, Coeur d'Alene, Idaho, 1929).

Ips oregoni (Eichh.). New attacks were common during August and September in lodgepole pine.

Pityokteines elegans Sw. ((Bl.)). The adults were collected in August and the preceding spring in western white pine.

Orthotomicus caelatus (Eichh.) ((Bl.)). The adults were collected in lodgepole pine and western white pine in June and July.

ORDER LEPIDOPTERA

Family Blastobasidae ((H.)).

A larva of this family was collected May 18, 1929 under the bark of a lodgepole pine. A similarly appearing larva was collected in May in western white pine.

ORDER DIPTERA

Family Cecidomyidae

Not predacious. The larvae of one or two undetermined species are common in lodgepole pine and western yellow pine in the same region in August and September, and the following spring.

Family Sciaridae

Sciarra sp. ((Gr.)). Not predacious. The adults are rather common on the bark of lodgepole pine in early June. Adults that appear to be of the same genus were abundant in August on the bark of western white pine.

Family Bibionidae ((Gr.)).

Not predacious. Larvae of this family were collected in May under the bark of lodgepole pine.

Family Xylophagidae

Xylophagus abdominalis Loew. ((Gr.)). Predacious. This is a fairly common species in lodgepole and western white pine. The adults were found on lodgepole pine during June and the first part of July. The eggs are probably laid under the bark during June. The incubation period ranged from 8 to 12 days. The larval stage probably requires about 10 months for development. No pupae were found in trees containing brood of Dendroctonus monticolae. The stadium of one pupa was eight days. In western white pine the biology is somewhat similar but adults were found the greater part of May. It was common in trees containing large numbers of Acanthocinus larvae, and frequently observed feeding on them. The following is a record of the insect galleries, host trees, and localities from which the larvae were collected.

<u>Insect Gallery</u>		<u>Host Tree</u>	<u>Locality</u>
<u>Dendroctonus monticolae</u> Hopk.	" "	Lodgepole pine	Sula, Montana
"	" "	Western Yellow Pine	" "
"	" "	" white "	Metaline Falls, Wn.
"	<u>pseudotsugae</u> Hopk.	Douglas Fir	" "
<u>Orthotomicus caelatus</u> Richh.		Lodgepole pine	Selway N. F., Idaho.
<u>Scolytus ventralis</u> (Lec.)		Grand Fir	Metaline Falls, Wn.
"	" "	" "	Coeur d'Alene, Idaho.

Family Stratiomyidae

Zabrnchia polita Coq. ((Gr.)). One adult was collected on lodgepole pine in July, 1928. One larva was collected in a western white pine tree June 12. The larvae are generally found in trees dead more than a year.

Family Dolichopodidae

Medeterus aldrichi Wh. ((Gr.)). Predacious. The most valuable predator in lodgepole, western white pine, and probably western yellow pine. The biology and seasonal history of this insect has been discussed in a paper now in preparation.

Family Empididae

Tachypesia corticalis Mel.? ((Gr.)). The adults were common on lodgepole pine all season; the larvae, however, have not been secured. Only one was observed in the western white pine stands.

Family Sarcophagidae

Phaonia n. sp. ((Al.)). Probably a facultative predator. A female was observed in August ovipositing in a western white pine. Larvae were collected in May and June, and one pupa in early July. In lodgepole pine a species which appeared to be the same was collected in the larval stage in June. They emerged as adults the first part of July. A gregarious chalcid was collected from the puparia of this species in western white pine.

Family Anthomyiidae ((Gr.)).

Larvae of this family were collected in May under the bark of
lodgepole pine.

Family Lonchaeidae

Lonchaea viridana Meigen. ((Gr.)). Facultative predator. Common.
In lodgepole pine the adults were found from the latter part of May to
September. The eggs were laid in August and September and are probably
laid the following spring. The incubation period requires five to six
days. Puparia were found the latter part of June. In western white pine
an adult was reared from a puparium 16 days after it had been formed.
Their general seasonal history appeared to be about the same in the two
regions. It is possible that some or all may have two generations a year.

ORDER HYMENOPTERA

Family Tenthridinidae

Amauronematis probably borealis Marl. ((W.)).

Amauronematis oregonensis Marl. ((W.)). The adults of these two species were reared during May from cocoons collected under the bark of lodgepole pine killed the previous year. Doubtless the trees were used only as a place for hibernation and post-feeding development.

Family Siricidae

Xeris spectrum race caudata Konow. The adults were observed ovipositing on lodgepole pine in late July and August.

Sirex californicus Ashm. The adults were found ovipositing on lodgepole pine in late July and August.

Family Encyrtidae

Cocloides n. sp. ((Cu.)). Primary parasite; the most important. An account of its seasonal history and biology is given in detail in a paper now in preparation.

Dendrosopter sp. ((Cu.)). This species is occasionally found on infested trees and in the laboratory larvae of the mountain pine beetle were freely parasitized, but in the field they were always found ovipositing on larvae of Ips latidens Lec. The egg resembles the egg of Cocloides and the larvae are practically indistinguishable. In lodgepole pine the adults were common in late May. The incubation period ranged from 8 to 10 days. The feeding period of one larva occupied 24 days. Adults emerged in September from cocoons collected the end of August. At least one and a half generations or a partial multibrood are indicated with an emergence in September and the occurrence of adults in May. No adults were found on western white pine.

Meteorus n. sp. ((Cu.)). Parasitic on the larvae of Hypophloeus parallelus Welsh. in lodgepole pine and western white pine.

Family Ichneumonidae

Gelis sp. ((Cu.)). Secondary parasite. Adults were reared from the cocoons of Cosloides sp. in lodgepole pine.

Family Diapriidae

Galeus nigricornis Ashm. ((Ga.)). Adults were reared in October, 1928 from undetermined dipterous puparia (probably Psychodidae) collected under the bark of lodgepole abandoned by the mountain pine beetle.

Family Proctotrupidae

Phaenoserphus abruptus (Say) ((Ga.)). Collected on western white pine during August and September. One female was observed to enter a beetle gallery by means of an exit hole made by a parent D. monticola.

Family Encyrtidae

New genus and species ((Ga.)). Several adults were collected during July, 1929 under the bark of lodgepole pine infested the previous year.

Family Chalcididae

Heydenia hubbardi Ashm. ((Ga.)). Though found frequently on infested lodgepole pine it apparently does not parasitize the brood of the mountain pine beetle. It has been observed ovipositing over the gallery of Ips latidens Lec., Pityogenes knechteli Sw., and Pityophthorus burksi Blackm. One was also reared from a hymenopterous cocoon collected from the gallery of Ips latidens; thus, it is maybe strictly a secondary parasite. It was not found on western white pine.

Family Eurytomidae

Eurytoma pinioidis Gir. ((Gn.)). A secondary parasite on Coeloides sp. It is abundant in lodgepole pine, but rare in western white pine. Some notes on its seasonal history and biology are in preparation.

Family Pteromalidae

Pachyceras ectoptosasteri Ratz. ((Gn.)). Primary parasite. This is a fairly common species in lodgepole pine which was found the entire season beginning with late June. The female does not oviposit through the bark but enters ventilation holes of the beetle and oviposites through the sides of the egg galleries. What is probably the same species was also found in western white pine after June 6.

Kutelus sp. or confusus Ashm. ((Gn.)). Four adults were collected the latter part of July in a down lodgepole pine tree infested also with Ips oregoni Fisch.

Cecidostiba dendroctoni Ashm. ((Gn.)). Primary parasite. It is a common species in both lodgepole and western white pine. The female oviposites through the bark. The adults were found the entire field season beginning the latter part of May in both lodgepole and western white pine.

Cecidostiba acutus (Prov.) ((Gn.)). Primary parasite. It was found only in western white pine. The seasonal history is probably similar to that of I. dendroctoni Ashm. It is possible that this species was overlooked in lodgepole pine.

Apparently a new genus and species close to Cecidostiba ((Gn.)). Probably a primary parasite. Adults were collected on lodgepole pine May 28, 1929. They were common the day of collection.

Rhopalicus pulchripennis Cwfd. ((Ga.)). Primary parasite. The adults were fairly common species on lodgepole pine the entire season beginning about the first of June. Indications are that it may also be occasionally a secondary on Coeloides sp. or larvae of other parasitic hymenoptera as a female was observed to go through the motions of oviposition in a hole bored by Coeloides and also one bored by Haydenia hubbardi Ashm. No individuals of this species or genus were found in western white pines.

Family Formicidae

Formica rufa var. Aggerans Sh. The adults were collected on the bark of lodgepole pine during June and July.

Formica fusca var. subaenescens Emery. The adults were observed on the bark of lodgepole pine in June and July.

Componotus herculeanus var. whymperi Forstl. The adults were observed in June on the bark of lodgepole pine.

Leptothorax sp. The adults were collected on an infested tree in July. (lodgepole pine).